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EXAMINER	
BROWN JR, NATHAN H	

ART UNIT	PAPER NUMBER
2129	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/571,602	BUSCEMA, PAOLO MASSINO	
	Examiner	Art Unit	
	NATHAN H. BROWN JR	2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

Examiner's Detailed Office Action

1. This Office Action is responsive to the communication for application 10/571,602, filed July 6, 2009.

2. Claims 13-28 are pending. Claims 13-16, 18, 19 are currently disclosed as amended. Claims 1-12 are cancelled. Claims 17, 20-26 are previously presented. Claims 27 and 28 are new.

3. After the previous office action, claims 13-26 stood rejected.

Objections to the Claims

4. Claim 16 is objected to under 37 CFR 1.75(c), as being of improper dependent form
for failing to further limit the subject matter of a previous claim. Applicant is required to
cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form,
or rewrite the claim(s) in independent form. Claim 16 recites the limitation "neural network according to any of claims 13-14"

in line one of the claim. Therefore, claim 16 is of improper dependent form as "any of claims" is defined as one, some, or all indiscriminately of whatever quantity of claims, i.e., claims 13 *and* 14.

5. Claims 16 and 27 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Claim 16 recites the limitation "neural network according to any of claims 13-14" in line one of the claim. Claim 27 recites the limitation "neural network according to any of claims 13-15" in line one of the claim. Therefore, claims 16 and 27 are of improper dependent form as "any of claims" is defined as one, some, or all indiscriminately of whatever quantity of claims, i.e., claims 13 and 14 or 13, 14 *and* 15 respectively. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 13-27 are rejected under 35 U.S.C. 101 because the claimed invention has no practical application. Amended independent claim 13 recites: "A neural network...wherein said neural network is implemented in a computer" producing a final result of "output data to a user". Examiner interprets a final result of non-specific "output data" based on non-specific "data" from a non-specific "database" provided to a non-specific "user" for no particular problem to be abstract and therefore non-tangible. Since, claim 13 recites no physical transformation of an article from one state to another, the invention of claim 13 is considered to have no practical application. Therefore, claim 13 is considered to be non-statutory under 35 U.S.C. 101. Claims 14-27 provide only detailed mathematical limitation of claim 13 without curing the deficiency of claim 13. Thus claims 13-27 are considered non-statutory under 35 U.S.C. 101.

9. Claim 28 is rejected under 35 U.S.C. 101 because the claimed invention has no practical application. Independent claim 28 recites a "program storage device readable by a machine, tangibly embodying a program of instructions... to perform a method for processing a set of input data" having a final result "wherein each node of the output layer outputs a transformation into output data of the input data that it has received from the input layer". A "program storage device readable by a machine, tangibly embodying a program of instructions... to perform a method" is considered to be a computer related manufacture. Claim 28 recites no data structure (e.g., an array). However, claim 28 is considered to recite a functional program combined with a non-paper tangible medium. Claim 28 also recites no physical transformation of any article from one state to another and the final result of claim 28, "a transformation into output data of the input data that it has received from the input layer", is considered to be a mathematical abstraction (a mapping). Therefore, claim 28 is considered to recite no tangible result and to thus be non-statutory under 35 U.S.C. 101.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 13-18 are rejected under 35 U.S.C. 102(b) as being anticipated by *Fahlman et al.* (*Fahlman*), "The Cascade-Correlation Learning Architecture", 1991.

Regarding claim 13. *Fahlman* teaches a neural network, comprising:

a plurality of nodes forming at least two layers, a first such layer being an input layer and a last such layer being an output layer, said input layer nodes and said output layer nodes being communicably connected (*see* p. 4, Figure 1);

wherein, in operation, input data from a database is input to said input layer, and the results of processing said data are output from the output layer, the output layer nodes forming output channels (*see* p. 6, §3.1. The Two-Spirals Problem,

Examiner interprets the "two-spirals" "training set...of 194 X-Y values" to comprise input data from a database which is input to said input layer through "two continuous-valued inputs", and the results of processing said data (see Figure 2) are output from the output layer ("a single output"), the output layer nodes forming an output channel for {+1,-1} output values.);

wherein each node of the output layer outputs a transformation into output data of the input data received from the input layer (*see* p. 3, §2. Description of Cascade-Correlation) said transformation comprising:

a first transformation step comprising at least a sub-step consisting in summing the input data received from the input nodes to the said output nodes by weighting the said input data (*see* p. 3, §2. Description of Cascade-Correlation, "The output unitsmay just produce a linear sum of their weighted inputs...") and

a second transformation step which transforms nonlinearly the results obtained by the first transformation step the output data obtained by the said transformation carried out in an output node being the output data (*see* p. 3, §2. Description of Cascade-Correlation, "The output units may just produce a linear sum of their weighted inputs, or they may employ some non-

linear activation function.", *Examiner interprets the employment of the non-linear activation function to apply to the first transformation step of summing the input data received from the input nodes.*),

wherein in each output node said first transformation step comprises two sub-steps:

a first sub-step being a nonlinear transformation function of the input data received by the output nodes from the input nodes (*see* above, *Examiner interprets the employment of the non-linear activation function may apply to* the input data received by the output nodes from the input nodes before *summing the input data received from the input nodes.*), and

the second sub-step being the summing step of the said nonlinearly transformed input data in the said first sub-step (*see* above, *Examiner interprets the summing the input data received from the input nodes may occur after the employment of the non-linear activation function may apply to the input data received by the output nodes from the input nodes.*),

wherein said neural network is implemented in a computer having a processor and memory, said computer arranged to input the data from the database to the input layer,

perform the summing and transformations of data at each node of the output layer and provide the output data to a user (*see* Figures 2-4 and pp. 6-10, §3. Benchmark Results, *Examiner interprets the graphics and the benchmark results to be a result of said neural network is implemented in a computer having a processor and memory, said computer arranged to input the data from the database to the input layer, perform the summing and transformations of data at each node of the output layer and provide the output data to a user (i.e., the experimenters)*.).

Regarding claim 14. *Fahlman* teaches an artificial neural network according to claim 13, wherein the input layer has a predetermined number of input nodes (*see* p. 3, paragraph 2, "The number of inputs and outputs is dictated by the problem and by the I/O representation the experimenter has chosen.");

wherein between the input and the output layer there is provided at least one further hidden layer of nodes (*see* p. 3, paragraph 4, "We add hidden units to the network one by one. Each new hidden unit receives a connection from each of the network's original inputs and also from every pre-existing hidden unit."), the nodes of said hidden layer being connected by weighted

connection to the input nodes of the input layer (*see* p. 3, paragraph 4, "The hidden unit's input weights are frozen at the time the unit is added to the net...") and to the nodes of a further hidden layer when more than one hidden layer is provided (*see* p. 3, paragraph 7, "To create a new hidden unit, we begin with a candidate unit that receives trainable input connections from all of the network's external inputs and from all pre-existing hidden units.");

wherein each node of the at least one hidden layer or of the more than one hidden layers and the nodes of the output layer carry out a transformation of the input data received from the input layer, or from a preceding hidden layer, into output data (*see* p. 4, Figure 1, *Examiner interprets the bottom two networks to show each node of the at least one hidden layer or of the more than one hidden layers and the nodes of the output layer carry out a transformation (i.e., sigmoid) of the input data received from the input layer, or from a preceding hidden layer, into output data.*), said transformation comprising:

a first transformation step consisting in two subsequent sub-steps:

a first sub-step consisting in a nonlinear transformation function of the input data received by the

output nodes, or by the nodes of a hidden layer, from the input nodes of the input layer or by the nodes of the preceding hidden layer (*see* p. 4, Figure 1, *Examiner interprets the bottom network to show a first sub-step consisting in a nonlinear transformation function of the input data received by the output nodes by the "Hidden Unit 2" from the nodes of the preceding hidden layer.*),

and a second sub-step consisting in summing the said input data being nonlinearly transformed in the first sub-step by further weighting the said nonlinearly transformed input data (*see* p. 3, §2. Description of Cascade-Correlation, *Examiner interprets the summing the input data received from the input nodes may occur after the employment of the non-linear activation function may apply to the input data received by the output nodes from the input nodes.*), and

a further second transformation step being carried out which transforms nonlinearly the results obtained by the first transformation step (*see* p. 4, Figure 1, *Examiner interprets the bottom network to show a further second transformation step being carried out by the "Hidden Unit 2" which transforms nonlinearly the results obtained by the first transformation step of the preceding hidden node.)*,

wherein the output data obtained by the said transformation carried out in the said nodes being the output data if the nodes are the output nodes of the output layer or the input data furnished from the nodes of a hidden layer to the nodes of a following hidden layer or to the output nodes of the output layer (*see* p. 4, Figure 1, *Examiner interprets the top network to show the output data obtained by the said transformation carried out in the said nodes being the output data if the nodes are the output nodes of the output layer. Examiner interprets the bottom network to show the input data furnished from the nodes of a hidden layer to the nodes of a following hidden layer or to the output nodes of the output layer.*), and

wherein the computer is further arranged to furnish data to, perform the transformations at, and output data from, each node of each hidden layer (*see* Figues 2-4 and pp. 6-10, §3. Benchmark Results, *Examiner interprets the graphics and the benchmark results to be a result of the computer being further arranged to furnish data to, perform the transformations at, and output data from, each node of each hidden layer.*).

Regarding claim 15. *Fahlman* teaches an artificial neural network according to claim 14, wherein the input data of the nodes of the input layer consist in the input data of the database (*see* p. 6, §3.1. The Two-Spirals Problem, *Examiner interprets the "two-spirals" "training set...of 194 X-Y values" to comprise input data of the nodes of the input layer consist in the input data of the database.*), while the output data of the nodes of the input layer are furnished to the nodes of the output layer or to the nodes of the first hidden layer or to the at least one hidden layer as input data of the nodes of these layers (*see* p. 4, Figure 1) and the output data of the output layer consist in the processing result of the artificial neural network (*see* Figures 2-4 and pp. 6-10, §3. Benchmark Results, *Examiner interprets the graphics to be the output data of the output layer and the benchmark results to be the processing results of the artificial neural network.*).

Regarding claim 17. (Previously presented) *Fahlman* teaches a neural network according to claim 14, wherein each node of the at least one hidden layer and of the output layer comprises several input channels for different input data (*see* p. 4, Figure 1, *Examiner considers each connection with another node to be an input channel for different*

input data.); to each channel being associated a receiver unit for carrying out the first nonlinear transformation sub-step of the first transformation step (*see* p. 4, Figure 1, *Examiner interprets a node receiving data from a channel to be a receiver unit for carrying out the first nonlinear transformation sub-step of the first transformation step.*); a summation unit being further provided having an input connected to the outputs of the receiver unit of each channel and for carrying out the second transformation sub-step of the first transformation step by summing the nonlinearly transformed input data of each channel to a value and a nonlinear transformation unit having an input connected to an output of the summation unit for carrying out the second transformation step by nonlinear filtering of the value obtained by the first transformation step and furnishing the output value of the node which is the input value of the nodes of a following hidden or of the output layer (*see* p. 4, Figure 1, *Examiner interprets a a node receiving data from a channel to also be a summation unit being further provided having an input connected to the outputs of the receiver unit of each channel and for carrying out the second transformation sub-step of the*

first transformation step by summing the nonlinearly transformed input data of each channel, etc.).

Regarding claim 28. (Previously presented) *Fahlman* teaches a program storage device readable by a machine (*see* Figues 2-4 and pp. 6-10, §3. Benchmark Results, *Examiner interprets the graphics and the benchmark results to be a result of a program storage device readable by the computer further arranged to furnish data to, perform the transformations at, and output data from, each node of each hidden layer.*), tangibly embodying a program of instructions executable by the machine to perform a method for processing a set of input data (*see* Figues 2-4 and pp. 6-10, §3. Benchmark Results, *Examiner interprets the graphics and the benchmark results to be a result of a program storage device tangibly embodying a program of instructions executable by the machine to perform a method for processing a set of input data.*), the method steps comprising:

providing a plurality of nodes forming at least two layers, a first such layer being an input layer and a last such layer being an output layer, said input layer nodes

and said output layer nodes being communicably connected (*see* p. 3, §2. Description of Cascade-Correlation);

inputting input data from a database to said input layer, and outputting the results of processing said data from the output layer, the output layer nodes forming output channels (*see* p. 6, §3.1. The Two-Spirals Problem, *Examiner interprets the "two-spirals" "training set...of 194 X-Y values" to comprise input data from a database which is input to said input layer through "two continuous-valued inputs", and the results of processing said data (see Figure 2) are output from the output layer ("a single output"), the output layer nodes forming output channels for {+1,-1} output values.*);

wherein each node of the output layer outputs a transformation into output data of the input data that it has received from the input layer (*see* p. 3, §2. Description of Cascade-Correlation), said transformation comprising:

a first transformation step comprising at least one sub-step consisting in summing the input data received from the input nodes to the said output nodes by weighting the said input data (*see* p. 3, §2. Description of Cascade-Correlation, "The output units

may just produce a linear sum of their weighted inputs...”), and

a second transformation step which nonlinearly transforms the results of the first transformation step (*see* p. 3, §2. Description of Cascade-Correlation, “...or they may employ some non-linear activation function. In the experiments we have run so far, we use a symmetric sigmoidal activation function (hyperbolic tangent)”, *Examiner interprets the application of the “symmetric sigmoidal activation function” to be to the weighted sum of the first transformation step.*),

wherein in each output node said first transformation step comprises two sub-steps:

a first sub-step being a nonlinear transformation function of the input data received by the output nodes from the input nodes (*see* above, *Examiner interprets the employment of the non-linear activation function may apply to* the input data received by the output nodes from the input nodes before *summing the input data received from the input nodes.*), and

the second sub-step being said summing step of the said input data which has been nonlinearly transformed in the said first sub-step (*see* above, *Examiner interprets the summing the input data received from the input nodes may occur after the employment of the non-linear activation function may apply to the input data received by the output nodes from the input nodes*.).

Response to Arguments

12. Applicant's arguments filed July 6, 2009 have been fully considered but they are not persuasive.

Rejection of Claims 13-28 Under 35 U.S.C. § 112 and § 101

Applicant(s) argue(s):

> In the Final Office Action the enumerated 35 U.S.C. 101 rejections are, in actuality, identical to the two 35 U.S.C. 112 rejections. All of these rejections are based upon the Exmainer's assertion that the claimed invention is "no more than a mathematical abstraction or algorithm," Final Office Action at 5, because "no computer hardware implementing said neural network is disclosed." Id. Similarly, in articulating the 35 U.S.C. 112 rejections, the Final Office Action states that the Examiner could find no disclosure of"a computer having a processor and memory."

> Final Office Action at 3-4 (paragraphs 5-6 of the Final Office Action).
>
> As described below, it is inconceivable to implement the claimed neural network except in a digital computer or data processor. A person skilled in the art reading the Specification would immediately understand that fact, and would never even imagine that the claimed innovation is an abstract idea that could be implemented using pen and paper, or in any device that does not have a data processor and memory. In fact, the entire science of neural networks grew out of, and remains solely within, the domains of artificial intelligence ("AI"), a sub\- discipline of computer science, and digital signal processing. Thus artificial neural networks are often used in signal processing applications, such as edge detection or image recognition software.
>
> In each and every known use of an artificial neural network, including those described in the references provided in the Specification, the given network is implemented on a digital computer.

Examiner disagrees. Before software simulation of neural network models on digital computers, analog learning machines like the MINOS I and II were used to implement "perceptron" models (*see* Nilsson, "The SRI Artificial Intelligence Center A Brief History", 1984, Technical Note 317, pp. 2-3).

Applicant(s) argue(s):

> Finally, the Examiner's point regarding the two examples described in the Specification being only is, respectfully, not fully understood by Applicant. The Wisconsin Breast Cancer Database was used to tune each of a standard back propagation artificial neural network and a "Sine Node" neural network according to an exemplary embodiment of the present invention. After the appropriate training/tuning, each artificial neural network (i. e., both the prior art

> back propagation type, and the novel type of the present invention) was used to make predictions. Specification at ¶¶ [0113] - [0116]. In every artificial neural network there is a training set of, e.g., database records, used to tune the neural network, which neural network can then be used to generate outputs given inputs - i.e., make predictions. Thus, 629 observations were used from the Wisconsin Breast Cancer Database to tune the neural network, and then the neural network's accuracy was tested by having it make predictions on 70 other observations form the same Wisconsin Breast Cancer Database. Id. at ¶ [0113].

Examiner's point is that data from The Wisconsin Breast Cancer Database is only used to confirm certain theoretical properties of the applicant's neural network algorithm with respect to "a classic Back-propagation neural network" in an experimental setting, as applicant states:

> In the following the behaviour [sic] of the neural network according to the present invention and the behaviour [sic] of a classic Back-propagation neural network are analysed [sic] by means of a trial on two real and complex databases. (p. 30 of the instant specification)

> Two approaches has [sic] been used. The first was a 9-fold cross validation with 629 observations in the training set and 70 observation in the prediction, to analyse [sic] capabilities of the network according to the present invention with regard to the over-fitting properties, and a second one was a 9 fold cross- validation approach obtaining 629 observations for the tuning set and 70 observations for the prediction set; the tuning set has been divided in training set (315) and testing set (314) to perform an "Early Stopping" approach to reduce the over-fitting phenomenon... (p. 31 of the instant specification)

> During the first experiment four different architectures for networks involved with 4, 8, 12 and 16 hidden units has

been tested in order to evaluate results sensibility on hidden units number. (p. 31 of the instant specification)

Applicant summarizes a first set of results:

About absolute performance the network according to the present invention get better results in all configurations obtaining also in a lower variance of outcomes. This means that the network according to the present invention is more reliable about over-fitting compared to classic Back-propagation networks. It appears also evident that the variability of results are lower in the network according to the present invention versus classic Back-propagation network. This fact underlines that the network according to the present invention is less sensitive about number of hidden units. (pp. 32-33 of the instant specification)

Applicant summarizes a second set of results:

A further experimental test was carried out, with 12 hidden units and using "Early stopping". This further experimental test confirms result showed in figure 18. Here the Back-propagation network had a larger improvement than the network according to the present invention stressing the better performances of the network according to the invention against over-fitting. (p. 33 of the instant specification)

Applicant summarizes the overall results:

Table 6 summarizes the result of the comparison between a classic Back-propagation network BP and the network according to the present invention SN on the Australian Credit Scoring dataset, with "Early Stopping" (Training-Testing-Prediction) and without (Training- Prediction). Figure 21 is a graphic representation of the results of table 6.

Absolute results and comparison between the first and the second trial confirms outcomes obtained with Breast Cancer dataset: namely better result of the network according to the invention with smaller variance and a larger difference of correctness between the first and the second trial for the Back-propagation network, suggesting the better

> behavior of network according to the invention about over-fitting problem. (p. 35 of the instant specification)

It is clear that applicant is only using the databases for experimental purposes and that applicant's neural network algorithm is never used on data from the databases to produce a practical real-world result like a breast cancer diagnosis or a credit application approval.

Further, it is well known among those of ordinary skill in the art of experimental computer science that such research results are contingent and subject to re-interpretation in light of new experimental or theoretical results. The potential for re-interpretation makes such results as cited by applicant, unlike the "final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades" of State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368, 1373, 47 USPQ2d 1596, 1601 (Fed. Cir. 1998).

It is also well known among those of ordinary skill in the art of experimental computer science that in order to determine that an algorithm is the sole cause for certain experimental results, it must be executed on different machines and different computer architectures to determine that the performance of the

algorithm has no unexpected dependence on a particular machine or architecture and that the significant part of the experimental results is due to the algorithm alone. Clearly, the "faster convergence" part of applicant's invention:

> improving an artificial neural network in such a way as to have better, more reliable and faster convergence of the algorithm to the best solution and avoiding also local minima during learning phase (p. 8 of the instant specification)

would be have to be demonstrated to *not* be tied to any particular machine or architecture if it is to be solely attributable to the applicant's invention. In which case, it would be clear that applicant's invention is not tied to a particular machine and thus fails the machine-prong of the machine-or-transformation test of Bilski.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan H. Brown, Jr. whose telephone number is 571-272- 8632. The examiner can normally be reached on M-F 0830-1700. If attempts to reach the examiner by telephone are unsuccessful, the

examiner’s supervisor, David Vincent can be reached on 571-272-3080. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/David R Vincent/
Supervisory Patent
Examiner, Art Unit 2129

Nathan H. Brown, Jr.
August 25, 2009